

## SEQUENCE LISTING

<110> Consiglio Nazionale delle Ricerche  
Domenico GERACI  
Angela BONURA  
Paolo COLOMBO

<120> Fusion proteins comprising modified allergens of the NS-LTPS  
family, use thereof and pharmaceutical compositions comprising  
the same

<130> 4161-18 / BW352R

<140> US  
<141> 2006-08-28

<150> PCT/IB2005/050714  
<151> 2005-02-28

<150> IT RM2004A000103  
<151> 2004-02-27

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Glu	Glu	Ala	Xaa	Gly	Lys	Val	Val	Gln	Asp	Ile	Met	Pro	Xaa	Leu	His	
1				5				10						15		

ttc	gtg	aag	ggg	gag	gag	aag	gag	ccg	tcg	aag	gag	nnn	nnn	agc	ggc	96
Phe	Val	Lys	Gly	Glu	Glu	Lys	Glu	Pro	Ser	Lys	Glu	Xaa	Xaa	Ser	Gly	
			20					25						30		

acg aag aag ctg agc gag gag gtg aag acg acg gag cag aag agg gag	144
Thr Lys Lys Leu Ser Glu Glu Val Lys Thr Thr Glu Gln Lys Arg Glu	
35 40 45	
gcc nnn aag nnn ata gtg cgc gcc acg aag ggc atc tcc ggt atc aaa	192
Ala Xaa Lys Xaa Ile Val Arg Ala Thr Lys Gly Ile Ser Gly Ile Lys	
50 55 60	
aat gaa ctt gtc gcc gag gtc ccc aag aag nnn gat att aag acc act	240
Asn Glu Leu Val Ala Glu Val Pro Lys Lys Xaa Asp Ile Lys Thr Thr	
65 70 75 80	
ctc ccg ccc atc acc gcc gac ttc gac tgc nnn aag atc caa agt act	288
Leu Pro Pro Ile Thr Ala Asp Phe Asp Cys Xaa Lys Ile Gln Ser Thr	
85 90 95	
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Ile Phe Arg Gly Tyr Tyr Gly Phe Gln Glu Thr Xaa Gly Thr Met Val	
100 105 110	
aga gcg ctg atg ccg nnn ctg ccg ttc gtg cag ggg aaa gag aaa gag	384
Arg Ala Leu Met Pro Xaa Leu Pro Phe Val Gln Gly Lys Glu Lys Glu	
115 120 125	
ccg tca aag ggg nnn nnn agc ggc gcc aaa aga ttg gac ggg gag acg	432
Pro Ser Lys Gly Xaa Xaa Ser Gly Ala Lys Arg Leu Asp Gly Glu Thr	
130 135 140	
aag acg ggg ccg cag agg gtg cac gct nnn gag nnn atc cag acc gcc	480
Lys Thr Gly Pro Gln Arg Val His Ala Xaa Glu Xaa Ile Gln Thr Ala	
145 150 155 160	
atg aag act tat tcc gac atc gac ggg aaa ctc gtc agc gag gtc ccc	528
Met Lys Thr Tyr Ser Asp Ile Asp Gly Lys Leu Val Ser Glu Val Pro	
165 170 175	
aag cac nnn ggc atc gtt gac agc aag ctc ccg ccc att gac gtc aac	576
Lys His Xaa Gly Ile Val Asp Ser Lys Leu Pro Pro Ile Asp Val Asn	
180 185 190	
atg gac nnn aag aca gtt gga gtg gtt cct cgg caa ccc caa ctt cca	624
Met Asp Xaa Lys Thr Val Gly Val Val Pro Arg Gln Pro Gln Leu Pro	
195 200 205	
gtc tct ctc cgt cat ggt ccc gtc acg ggc cca agt gat ccc gcc cac	672
Val Ser Leu Arg His Gly Pro Val Thr Gly Pro Ser Asp Pro Ala His	
210 215 220	
aaa gca cgg ttg gag aga ccc cag att aga gtt ccg ccc ccc gca ccg	720
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Glu Lys Ala	

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 Glu, Asp, Gly, Ala, Val, Gln, His, Pro, Leu, Tyr, Trp, Cys or Phe

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 <223> Xaa at location 14 stands for Lys, Asn, Arg, Ser, Thr, Ile, Met,  
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<220>  
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 <223> Xaa at location 29 stands for Lys, Asn, Arg, Ser, Thr, Ile, Met,  
 Glu, Asp, Gly, Ala, Val, Gln, His, Pro, Leu, Tyr, Trp, Cys or Phe

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 <223> Xaa at location 30 stands for Lys, Asn, Arg, Ser, Thr, Ile, Met,  
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 <223> Xaa at location 52 stands for Lys, Asn, Arg, Ser, Thr, Ile, Met,  
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 <223> Xaa at location 75 stands for Lys, Asn, Arg, Ser, Thr, Ile, Met,  
 Glu, Asp, Gly, Ala, Val, Gln, His, Pro, Leu, Tyr, Trp, Cys or Phe

<220>  
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 <223> Xaa at location 91 stands for Lys, Asn, Arg, Ser, Thr, Ile, Met,  
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<223> Xaa at location 108 stands for Lys, Asn, Arg, Ser, Thr, Ile, Met, Glu, Asp, Gly, Ala, Val, Gln, His, Pro, Leu, Tyr, Trp, Cys or Phe

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<223> Xaa at location 118 stands for Lys, Asn, Arg, Ser, Thr, Ile, Met, Glu, Asp, Gly, Ala, Val, Gln, His, Pro, Leu, Tyr, Trp, Cys or Phe

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<223> Xaa at location 133 stands for Lys, Asn, Arg, Ser, Thr, Ile, Met, Glu, Asp, Gly, Ala, Val, Gln, His, Pro, Leu, Tyr, Trp, Cys or Phe

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<223> Xaa at location 134 stands for Lys, Asn, Arg, Ser, Thr, Ile, Met, Glu, Asp, Gly, Ala, Val, Gln, His, Pro, Leu, Tyr, Trp, Cys or Phe

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<223> Xaa at location 154 stands for Lys, Asn, Arg, Ser, Thr, Ile, Met, Glu, Asp, Gly, Ala, Val, Gln, His, Pro, Leu, Tyr, Trp, Cys or Phe

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<223> Xaa at location 156 stands for Lys, Asn, Arg, Ser, Thr, Ile, Met, Glu, Asp, Gly, Ala, Val, Gln, His, Pro, Leu, Tyr, Trp, Cys or Phe

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<222> (179)..(179)

<223> Xaa at location 179 stands for Lys, Asn, Arg, Ser, Thr, Ile, Met, Glu, Asp, Gly, Ala, Val, Gln, His, Pro, Leu, Tyr, Trp, Cys or Phe

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Phe Val Lys Gly Glu Glu Lys Glu Pro Ser Lys Glu Xaa Xaa Ser Gly  
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Thr Lys Lys Leu Ser Glu Glu Val Lys Thr Thr Glu Gln Lys Arg Glu  
35 40 45

Ala Xaa Lys Xaa Ile Val Arg Ala Thr Lys Gly Ile Ser Gly Ile Lys  
50 55 60

Asn Glu Leu Val Ala Glu Val Pro Lys Lys Xaa Asp Ile Lys Thr Thr  
65 70 75 80

Leu Pro Pro Ile Thr Ala Asp Phe Asp Cys Xaa Lys Ile Gln Ser Thr  
85 90 95

Ile Phe Arg Gly Tyr Tyr Gly Phe Gln Glu Thr Xaa Gly Thr Met Val  
100 105 110

Arg Ala Leu Met Pro Xaa Leu Pro Phe Val Gln Gly Lys Glu Lys Glu  
115 120 125

Pro Ser Lys Gly Xaa Xaa Ser Gly Ala Lys Arg Leu Asp Gly Glu Thr  
130 135 140

Lys Thr Gly Pro Gln Arg Val His Ala Xaa Glu Xaa Ile Gln Thr Ala  
145 150 155 160

Met Lys Thr Tyr Ser Asp Ile Asp Gly Lys Leu Val Ser Glu Val Pro  
165 170 175

Lys His Xaa Gly Ile Val Asp Ser Lys Leu Pro Pro Ile Asp Val Asn  
180 185 190

Met Asp Xaa Lys Thr Val Gly Val Val Pro Arg Gln Pro Gln Leu Pro  
195 200 205

Val Ser Leu Arg His Gly Pro Val Thr Gly Pro Ser Asp Pro Ala His  
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Glu Lys Ala

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ttc gtg aag ggg gag gag aag gag ccg tgc aag gag agc agc agc ggc	96
Phe Val Lys Gly Glu Glu Lys Glu Pro Ser Lys Glu Ser Ser Ser Gly	
20 25 30	

acg aag aag ctg agc gag gag gtg aag acg acg gag cag aag agg gag	144
Thr Lys Lys Leu Ser Glu Glu Val Lys Thr Thr Glu Gln Lys Arg Glu	
35 40 45	
gcc tgc aag tgc ata gtg cgc gcc acg aag ggc atc tcc ggt atc aaa	192
Ala Cys Lys Cys Ile Val Arg Ala Thr Lys Gly Ile Ser Gly Ile Lys	
50 55 60	
aat gaa ctt gtc gcc gag gtc ccc aag aag tgc gat att aag acc act	240
Asn Glu Leu Val Ala Glu Val Pro Lys Lys Cys Asp Ile Lys Thr Thr	
65 70 75 80	
ctc ccg ccc atc acc gcc gac ttc gac tgc tcc aag atc caa agt act	288
Leu Pro Pro Ile Thr Ala Asp Phe Asp Cys Ser Lys Ile Gln Ser Thr	
85 90 95	
att ttc aga ggt tac tat gga ttc caa gaa acc agc ggg act atg gtg	336
Ile Phe Arg Gly Tyr Tyr Gly Phe Gln Glu Thr Ser Gly Thr Met Val	
100 105 110	
aga gcg ctg atg ccg tgc ctg ccg ttc gtg cag ggg aaa gag aaa gag	384
Arg Ala Leu Met Pro Cys Leu Pro Phe Val Gln Gly Lys Glu Lys Glu	
115 120 125	
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Pro Ser Lys Gly Ser Ser Ser Gly Ala Lys Arg Leu Asp Gly Glu Thr	
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aag acg ggg ccg cag agg gtg cac gct tgt gag tgc atc cag acc gcc	480
Lys Thr Gly Pro Gln Arg Val His Ala Cys Glu Cys Ile Gln Thr Ala	
145 150 155 160	
atg aag act tat tcc gac atc gac ggg aaa ctc gtc agc gag gtc ccc	528
Met Lys Thr Tyr Ser Asp Ile Asp Gly Lys Leu Val Ser Glu Val Pro	
165 170 175	
aag cac tgc ggc atc gtt gac agc aag ctc ccg ccc att gac gtc aac	576
Lys His Cys Gly Ile Val Asp Ser Lys Leu Pro Pro Ile Asp Val Asn	
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Val Ser Leu Arg His Gly Pro Val Thr Gly Pro Ser Asp Pro Ala His	
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aaa gca cgg ttg gag aga ccc cag att aga gtt ccg ccc ccc gca ccg	720
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gaa aaa gcc taa	732
Glu Lys Ala	

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 <212> PRT  
 <213> Parietaria judaica

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Phe	Val	Lys	Gly	Glu	Glu	Lys	Glu	Pro	Ser	Lys	Glu	Ser	Ser	Ser	Gly
			20					25					30		
Thr	Lys	Lys	Leu	Ser	Glu	Glu	Val	Lys	Thr	Thr	Glu	Gln	Lys	Arg	Glu
			35				40					45			
Ala	Cys	Lys	Cys	Ile	Val	Arg	Ala	Thr	Lys	Gly	Ile	Ser	Gly	Ile	Lys
	50					55					60				
Asn	Glu	Leu	Val	Ala	Glu	Val	Pro	Lys	Lys	Cys	Asp	Ile	Lys	Thr	Thr
65					70					75					80
Leu	Pro	Pro	Ile	Thr	Ala	Asp	Phe	Asp	Cys	Ser	Lys	Ile	Gln	Ser	Thr
				85					90					95	
Ile	Phe	Arg	Gly	Tyr	Tyr	Gly	Phe	Gln	Glu	Thr	Ser	Gly	Thr	Met	Val
			100					105					110		
Arg	Ala	Leu	Met	Pro	Cys	Leu	Pro	Phe	Val	Gln	Gly	Lys	Glu	Lys	Glu
		115					120					125			
Pro	Ser	Lys	Gly	Ser	Ser	Ser	Gly	Ala	Lys	Arg	Leu	Asp	Gly	Glu	Thr
		130				135					140				
Lys	Thr	Gly	Pro	Gln	Arg	Val	His	Ala	Cys	Glu	Cys	Ile	Gln	Thr	Ala
145					150					155					160
Met	Lys	Thr	Tyr	Ser	Asp	Ile	Asp	Gly	Lys	Leu	Val	Ser	Glu	Val	Pro
				165					170					175	
Lys	His	Cys	Gly	Ile	Val	Asp	Ser	Lys	Leu	Pro	Pro	Ile	Asp	Val	Asn
			180					185					190		
Met	Asp	Cys	Lys	Thr	Val	Gly	Val	Val	Pro	Arg	Gln	Pro	Gln	Leu	Pro
		195					200					205			
Val	Ser	Leu	Arg	His	Gly	Pro	Val	Thr	Gly	Pro	Ser	Asp	Pro	Ala	His
		210				215					220				
Lys	Ala	Arg	Leu	Glu	Arg	Pro	Gln	Ile	Arg	Val	Pro	Pro	Pro	Ala	Pro
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Glu	Lys	Ala													

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